At present, the gas produced by most biogas plants is used locally in a combined heat and power plant. Alongside this direct approach to producing electricity, supplying the biomethane contained in the biogas to the gas grid is another efficient way of using this renewable source of energy and a method with impressive flexibility which can be used anywhere.

To achieve the gas quality and methane purity needed for the grid, the raw biogas has to enriched. One system concept for treating biogas using a membrane process is provided by international company BORSIG Membrane Technology GmbH, a member of the BORSIG Group. “Compared with conventional treatment processes for separating CO2, membrane technology offers a number of technical benefits,” reports project manager Achim Depner. “Gas separation using membranes is a continuous, purely pressure-driven gas separation process. The membrane process requires no additional equipment, and no laborious regeneration or treatment of other media is needed. This flexible process setup allows us to tailor our modular concepts accurately to the needs of each location.”

Round-the-clock availability needed

Through its comprehensive services, BORSIG hopes to provide its customers with outstanding reliability and operating safety. For this promise to cover all elements of the system, the company attaches great importance to high-quality systems engineering and components that have been proven several times over in industrial applications. “Any failure or downtime is associated with high costs, and in the worst case scenario, supply bottlenecks,” explains Depner. “Our biogas treatment systems should run without any interruption – 24 hours a day, 365 days a year.”

»Our biogas treatment systems should run without any interruption – 24 hours a day, 365 days a year.«

Achim Depner, BORSIG

The system concepts of BORSIG Membrane Technology GmbH provide efficient process solutions for biogas treatment based on membrane processes. To ensure round-the-clock availability, the intrinsically safe ACT20X signal converters from Weidmüller support extensive safety monitoring.

In continuous use, thanks to extensive safety monitoring: the membrane modules in BORSIG’s process solution
standardised signal values. With the BORSIG systems, all signals from the transmitters and the approx. 50 sensors and 30 to 40 actuators are sent to the ACT20X modules.

“One of the requirements of BORSIG was that the PT100 resistance thermometer can be connected to the signal converter itself. Extensive certification for the separation of the explosive risk zone was also important to them,” reports Gustav Lage, project planning and planning manager at Bormann und Reinhold. “As well as satisfying these requirements, we were impressed by the way that Weidmüller’s signal converters could be accurately adjusted in many different ways using the WI-Manager software.”

Reliable, standardised signal values

A key role in this safety monitoring process is played by the ACT20X signal converter from Weidmüller, which switching system manufacturer Bormann und Reinhold included specifically, in view of the stringent safety conditions. With their intrinsically safe inputs for standard DC, temperature and resistance signals, they reliably separate the zone at risk of explosion from the safe zone. Used near sensors, the ACT20X modules are perfectly suited to galvanically decoupling the control level from the sensor level and generating reliable, standardised signal values. The performance features of the ACT20X ensure that temperature fluctuations, electromagnetic interference, vibration, corrosion and atmospheres at risk of explosion don’t affect the accuracy of signal transmission and conversion in any way. The biogas treatment system customers benefit from accurately calculated measurements which can be transferred as stable 4 to 20 mA signals over long distances. The extensive monitoring and alarm functions of the signal converters also offer increased safety. The integrated programmable relay output issues an alert in the event of malfunctions; this makes troubleshooting faster and easier and also reduces facility downtimes.

»Extensive certification for the separation of the explosive risk zone was important to BORSIG.«

Gustav Lage, Bormann und Reinhold

Gas separation with membranes is a continuous, purely pressure-driven gas separation process